Frizzled 7 maintains the undifferentiated state of human limbal stem/progenitor cells.

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Public Summary:
Wnt signaling pathway plays an important role in the regulation of human limbal stem/progenitor cells (LSCs). To examine the possible function of Frizzled (Fz) receptors in LSCs, the expression of ten Fz receptors was profiled in the limbus and cornea. Only Fz7 had preferential expression in the basal limbal epithelium which contains the LSCs. The expression of Fz7 was co-localized with the putative LSC markers including p63alpha, N-cadherin and keratin (K) 14 and was minimum in cells expressing the corneal maturation marker K12. The expression of Fz7 was higher in the enriched LSCs population and decreased in cultured LSCs when there was a loss of progenitor phenotype. When the Fz7 was knocked down (FzKD) using shRNA in primary LSCs, the expression of putative LSCs markers ABCG2, Np63alpha and K14 was decreased significantly. The colony forming efficiency of the Fz7KD LSCs was significantly decreased in the subsequent passage 1 and 2 compared to the control. Our finding suggests that Wnt signaling is one of the factors of LSC niche maintenance and Fz7 helps to maintain the undifferentiated state of LSCs. Stem Cells 2013.

Scientific Abstract:
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